

## Hybrid Prediction Method for Aircraft Interior Noise, Phase II

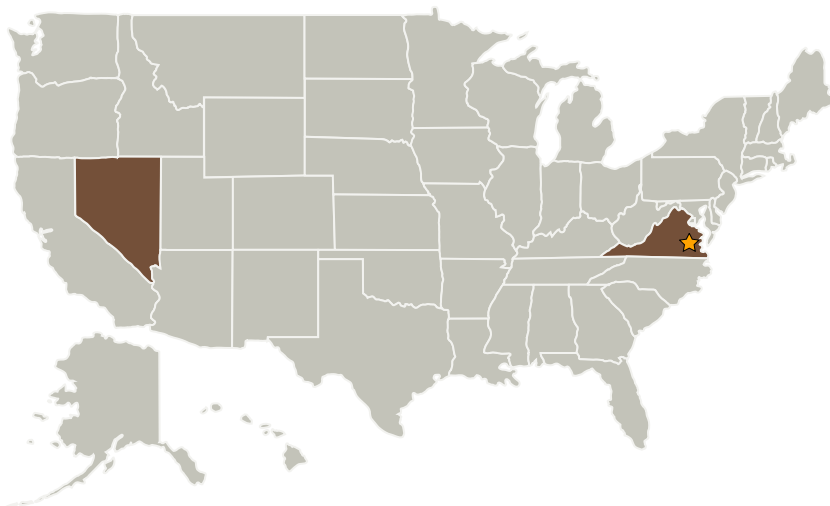
Completed Technology Project (2005 - 2007)



## Project Introduction

The goal of the project is research and development of methods for application of the Hybrid FE-SEA method to aircraft vibro-acoustic problems. This proposal discusses the development and application of new methods of structural-acoustic analysis in order to address existing problems in aircraft interior noise prediction. The proposed methods are based on a hybrid modeling strategy that combines Finite Element Analysis (FEA) and Statistical Energy Analysis (SEA). Over the past five years, Vibro-Acoustic Sciences has devoted a considerable research effort towards the development of a framework for combining these two analysis methods. Recent research carried out by over the past two years has resulted in the development of a rigorous solution to this problem. The resulting Hybrid approach has been derived in general terms and validated for a number of simple structural-acoustic problems. However, the method has not yet been applied to aircraft interior noise prediction. A number of candidate aircraft interior noise problems have been identified which would benefit greatly from the use of the Hybrid method. The aims of the research described in this proposal are therefore: (i) to demonstrate the application of the Hybrid method to a number of existing aircraft interior noise problems, (ii) to develop the method to ensure it contains sufficient functionality to address practical aircraft interior noise problems and (iii) to demonstrate the value of the method in the prediction and reduction of noise in airframe systems.

## Primary U.S. Work Locations and Key Partners



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Organizational  
Responsibility**Responsible Mission  
Directorate:**

Space Technology Mission  
Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation  
Research/Small Business Tech  
Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
● Early Stage Innovations(ESI)	Supporting Organization	NASA Other	

## Primary U.S. Work Locations

Nevada	Virginia
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX04 Robotic Systems
  - └ TX04.2 Mobility
    - └ TX04.2.5 Robot Navigation and Path Planning